

WHAT WE CLAIM IS:

1. An automated method for removing a fluid substance from a collection device comprising a fluid-holding vessel and a cap, the method comprising the steps of:

- 5 a) puncturing a surface of the cap with a fluid transfer device;
- b) pausing movement of the fluid transfer device prior to contacting a fluid substance contained in the vessel;
- c) continuing movement of the fluid transfer device after step b) until the fluid transfer device contacts the fluid substance contained in the vessel;
- 10 d) drawing at least a portion of the fluid substance into the fluid transfer device; and
- e) removing the fluid transfer device from the collection device.

2. The method of claim 1, wherein the fluid substance is obtained from a biological fluid selected from the group consisting of blood, urine, saliva, sputum, mucous or other bodily secretion, pus, amniotic fluid, cerebrospinal fluid and seminal fluid.

3. The method of claim 1, wherein the fluid transfer device is a plastic pipette tip.

20 4. The method of claim 3, wherein the pipette tip includes one or more ribs extending outwardly from an outer surface thereof, and wherein at least one of the ribs contacts the surface of the cap during step a).

25 5. The method of claim 3, wherein the pipette tip includes one or more grooves recessed from an outer surface thereof, and wherein at least one air passageway is formed between at least one of the grooves and the surface of the cap during step a).

30 6. The method of claim 3, wherein a lubricant is applied to at least a portion of the pipette tip or the surface of the cap prior to step a).

7. The method of claim 3, wherein the cap includes one or more radially extending ribs positioned on the surface of the cap.

5 8. The method of claim 1, wherein the movement of the fluid transfer device is paused for a period of time sufficient to permit air to vent from within the collection device during step b).

10 9. The method of claim 1, wherein the movement of the fluid transfer device is paused for at least about 0.5 seconds during step b).

10 10. The method of claim 1 further comprising withdrawing the fluid transfer device from the punctured surface of the cap between steps a) and c).

15 11. The method of claim 10, wherein the movement of the fluid transfer device is paused for at least about 0.5 seconds during step b).

12. The method of claim 1, wherein the speed of the fluid transfer device during step c) is greater than the speed of the fluid transfer device during step a).

20 13. The method of claim 12 further comprising withdrawing the fluid transfer device from the punctured surface of the cap between steps a) and c).

14. The method of claim 12, wherein the movement of the fluid transfer device is paused for at least about 0.5 seconds during step b).

25 15. The method of claim 14 further comprising withdrawing the fluid transfer device from the punctured surface of the cap between steps a) and c).

16. The method of claim 1, wherein the surface of the cap punctured in step
30 a) is a plastic molded in the form of a generally conical inner wall.

17. The method of claim 16, wherein the inner wall includes a plurality of radially extending striations.

18. The method of claim 1, wherein the cap contains a wick for limiting
5 the release of an aerosol from the vessel during the penetrating step.

19. The method of claim 18, wherein the wick is selected from the group consisting of pile fabrics, sponges, foams, felts, sliver knits, GORE-TEX® fabrics and spandex.

10 20. The method of claim 18 further comprising penetrating a seal affixed to the cap with the fluid transfer device, wherein the seal maintains the wick within the cap.

15 21. An automated method for removing a fluid substance from a collection device comprising a fluid-holding vessel and a cap, the method comprising the steps of:

- a) contacting a surface of the cap with a fluid transfer device moving at a first speed;
- b) puncturing the surface of the cap with the fluid transfer device;
- c) entering the collection device with the fluid transfer device moving at 20 a second speed, wherein the second speed is greater than the first speed;
- d) contacting the fluid substance with the fluid transfer device;
- e) drawing at least a portion of the fluid substance into the fluid transfer device; and
- f) removing the fluid transfer device from the collection device.

25 22. The method of claim 21, wherein the fluid substance is obtained from a biological fluid selected from the group consisting of blood, urine, saliva, sputum, mucous or other bodily secretion, pus, amniotic fluid, cerebrospinal fluid and seminal fluid.

30 23. The method of claim 21, wherein the fluid transfer device is a plastic pipette tip.

24. The method of claim 23, wherein the pipette tip includes one or more ribs extending outwardly from an outer surface thereof, and wherein at least one of the ribs contacts the surface of the cap during step b).

5 25. The method of claim 23, wherein the pipette tip includes one or more grooves recessed from an outer surface thereof, and wherein at least one air passageway is formed between at least one of the grooves and the surface of the cap during step b).

10 26. The method of claim 23, wherein a lubricant is applied to at least a portion of the pipette tip or the surface of the cap prior to step a).

27. The method of claim 23, wherein the cap includes one or more radially extending ribs positioned on the surface of the cap.

15 28. The method of claim 21, wherein the surface of the cap punctured in step b) is a plastic molded in the form of a generally conical inner wall.

29. The method of claim 28, wherein the inner wall includes a plurality of radially extending striations.

20 30. The method of claim 21, wherein the cap contains a wick for limiting the release of an aerosol from the vessel during the penetrating step.

25 31. The method of claim 30, wherein the wick is selected from the group consisting of pile fabrics, sponges, foams, felts, sliver knits, GORE-TEX® fabrics and spandex.

32. The method of claim 30 further comprising penetrating a seal affixed to the cap with the fluid transfer device, wherein the seal maintains the wick within the cap.

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